WHAT IS CLAIMED IS:

1. A method of eliminating sidelobes in a communication channel between a base station and a mobile station, comprising the steps of:

(a) generating control signals and data signals within the communication channel, said control signals having a first sequence of L-bits and a second sequence of L-bits;

(b) autocorrelating the first and second sequences to generate first and second autocorrelated values;

(c) cross-correlating the first and second sequences to generate first and second cross-correlated values; and

(d) combining the first and second autocorrelated values and the first and second cross-correlated values.

2. The method of claim 1, wherein lowest out-of-phase coefficients of the autocorrelation function is –4.

3. The method of claim 1, wherein a result of step (d) comprise maximum peaks at zero and middle time shifts, which are equal to each other and opposite in polarity.

4. The method of claim 1, wherein the communication channel includes a frame having L number of slots, wherein step (d) allows at least one of slot-by-slot frame synchronization, channel estimation, double check frame synchronization and single frame synchronization.

5. The method of claim 1, wherein each of said first and second sequences of L-bits includes a first prescribed number (b_0) of bit values equal to "0" and a second prescribed number (b_1) of bit values equal to "1", wherein b_1-b_0 is +1 or –1.

6. The method of claim 1, wherein the communication channel comprises a plurality of frames, each frame having L number of slots and each slot has N number of pilot bits such that there are N number of sequences of L-bits in a frame, said first and second sequences being sequences of the N number of sequences.

7. The method of claim 3, wherein the maximum peak at zero time shift is a first prescribed number*L, and the maximum peak at middle time shift is -(prescribed number*L).

8. The method of claim 6, wherein between adjacent sequences, there are a prescribed number b_3 of bit values which are the same and there a prescribed number b_4 of bit values which are different such that b_3-b_4 is +1 or −1.

9. The method of claim 6, wherein said control signals include a third sequence of L-bits and a fourth sequence of L-bits, and further comprising the steps of:

autocorrelating the third and fourth sequences to generate third and fourth autocorrelated values; and

cross-correlating the third and fourth sequences to generate third and fourth cross-correlated values, wherein the combining step comprises combining the first, second, third and fourth autocorrelated values and the first, second, third and fourth cross-correlated values.

10. The method of claim 9, wherein the sequences used for frame synchronization are members of a family of i sequences.

11. The method of claim 10, wherein i=8, L=15 and N=2 to 32, each frame having a period of 10ms and each slot having a period of about 0.667ms.

12. The method of claim 9, wherein step (d) comprises adding the first, second, third and fourth autocorrelated values and adding the first, second, third and fourth cross-correlated values.

13. A method of establishing a communication channel, the method comprising the steps of:

generating a plurality of frames; and

generating a 15 slots for each frame, each slot having a pilot signal of N-bits and a corresponding bit in each slot forming a word of 15 sequence of pilot bits such that there is N number of words, wherein the number of bit values of two pilot bits which are the same between two adjacent words from 1 to 15 slots minus the number of bit values of two pilot bits which are different between the two adjacent words from 1 to 15 is +1 or −1.

14. A method of establishing a communication channel having at least one of frame synchronization and channel estimation, the method comprising the steps of:

generating a plurality of frames; and

generating a L-number of slots for each frame, each slot having a pilot signal of N-bits and a corresponding bit in each slot forming a word of L-sequence of pilot bits such that there is N number of words, wherein each of a prescribed number of N number

of words have a first prescribed number (b_0) of bit values equal to "0" and a second prescribed number (b_1) of bit values equal to "1" such that b_1-b_0 is +1 or −1, wherein

a pair of the prescribed number of N number of words is cross-correlated, and a pair of the prescribed number of N number of words is autocorrelated, such that maximum peaks at zero and middle time shifts, which are equal to each other and opposite in polarity, are formed.

15. A method of reducing sidelobes, comprising the steps of:

generating a plurality of frame words, each frame word having a plurality of bits;

performing autocorrelation functions on a pair of frame words to generate a pair of autocorrelated value sets;

preforming cross-correlation function on a pair of frame words to generate a pair of cross-correlated value sets; and

combining the pair of autocorrelated value set and cross-correlated value sets such that two peak values equal in magnitude and opposite in polarity are achieved at zero and middle time shifts.

16. A method of generating pilot signals of a prescribed pattern within a frame having 15 slots, comprising the steps of:

generating N pilot bits for each slot; and

forming N words of 15-bit based on above step, wherein each of a prescribed number of N words has a first prescribed number b_0 of bit values of "0" and a second prescribed number b_1 of bit values of "1", such that b_1-b_0 is +1 or −1.

17. A communication link between a user equipment and a base station comprising a plurality of layers, wherein one of the layers is a physical layer for establishing communication between the user equipment and the base station and the physical layer has at least one of data and control information, one of the control information being a pilot field of N-bits transmitted for 15 slots such that N words of 15 bits are formed, wherein a pair of N words is cross-correlated and a pair of N words is autocorrelated.